NCI Workforce Plan: FY 2002-2003
May 30, 2001

1. What skills are currently vital to the accomplishment of the agency's goals and objectives?

The mission of the National Cancer Institute is to stimulate and support scientific discovery and its application to achieve a future when all cancers are uncommon and easily treated. NCI has implemented a comprehensive strategic science planning, implementation and evaluation framework that includes the NCI Bypass Budget planning process and the results-based planning models in NCI's business and scientific divisions. This framework promotes scientific achievement and results by clearly defining goals and measures of success for all scientific areas, compounded by administrative goals that are linked to the scientific goals. Based on this comprehensive and complex process to outline the nation's research agenda, current core areas of specialized need have been identified that include: both internal and external investigator-initiated research; development of new Cancer Centers, Networks, and Consortia; development, management and oversight of a National Clinical Trials Program, the study of emerging trends in cancer, Quality of Cancer Care, Reducing Cancer-Related Health Disparities, Informatics and Information Flow, and Training, Education, and Career Development.

New areas of focus and/or specialized research need include: genes and environment, cancer imaging, defining the signatures of cancer cells, cancer biology, new molecular targets of prevention and treatment, tobacco and tobacco-related cancers, and informatics and new technology based cancer communications. To build upon current revolving scientific discovery, NCI needs to have the vital skills in areas such as the ability to develop, execute and manage complex clinical trial and cancer treatment program, genetics research both basic and clinical, epidemiology, population sciences in the areas of treatment and prevention, bioinformatics, proteomics, cancer biology and others professions as described on **Attachment 1.** Specialized administrative and business skills necessary to build and maintain the research and research management infrastructure including: grants management, specialized recruitment and compensation areas; resource and management oversight, information technology, technology transfer and the analytical, policy development and implementation skills necessary to carry out reform initiatives including contracting out (A-76), streamlining, performance based contracting, e-commerce, etc.

2. What changes are expected in the work of the agency (e.g. due to changes in mission/goals, technology, new/terminated programs or functions, and shifts to contracting out)? How will this affect the agency's human resources? What skills will no longer be required, and what new skills will the agency need in the next five years?

Goals are expected to evolve in three areas: the explosion of information on the fundamental nature of cancer; the development of new research platforms and tools and approaches for conducting clinical research that test these insights in patients; and a growing sophistication in behavioral and population research that provide researchers

with an improved understanding and method to address the burden of cancer. Underlying these three areas of progress are key changes that will modify the way scientific discovery is accomplished:

1) "designed" research in which scientists identify a range of compelling options for prevention, detection, diagnosis, and treatment; verify their efficacy using models and electronic tools; and validate them through extensive testing and clinical trials;

2) research that brings together and melds different scientific perspectives and the tools and/or multiple disciplines;

3) the ability to conduct research on a large scale and with greater complexity has increased significantly.

Due to the changing nature of the research enterprise, evolving with each new discovery, it is difficult to forecast specific human resource requirements. For example, the bioinformatics field is absolutely essential today, but it did not exist a few years ago. In this specialized area the need is great, the market unbelievably competitive and the talent limited. Through several planning initiatives that include both our scientific and business infrastructure communities, we plan to identify (or take our best guess at) the new skills required in the next five years, as well as the skills that will be no longer be required.

For example, a worldwide business consultant (Hay Group), is helping us evaluate current work processes and job responsibilities to assist in job redesign and strategic staffing. We are beginning with one of NCI's divisions, the Division of Cancer Biology (DCB), that is charged with program management for nearly ¾ of billion dollars. Through this process the Hay group will establish job design criteria by which new or revised jobs will be forecasted; determine knowledge, skills, abilities and competencies needed for the tasks; conduct a staffing gap analysis by matching skills of the current workforce to those skills required for the redesigned jobs; analyze implications for retention, retraining, recruitment, accelerated retirements, etc.; and determine the appropriate organizational structure for the new DCB to ensure alignment of its organization to its strategic objectives and priorities. The NCI plans to continue and expand this initiative into other critical program areas in the future.

3. <u>What recruitment, training, and retention strategies are being implemented to help ensure that the agency has, and will continue to have, a high-quality, diverse work force?</u>

In recruitment, NCI currently uses as many as 14 different hiring and compensation mechanisms found in U.S. Code Titles 5, 38, and 42 to appoint scientific, clinical, technical, administrative, and support staff, each with its own unique procedural requirements. To attract and retain a high-quality work force the NCI uses a variety of available compensation flexibilities, such as recruitment and retention monies, loan repayments, appointments above the minimum (ATM), Physicians Comparability Allowance (PCA), and Physician Special Pay under Title 38. When appropriate, the NCI

appoints staff under Title 42, with its inherent pay flexibilities and streamlined hiring process that enable us to move more quickly in a highly competitive labor market. In addition, NCI has undertaken a major, results-based management initiative that includes succession planning as an integral component to ensure that our cadre of skilled leaders is not compromised by attrition. We are in the early stages of developing an objective plan that will identify our core values and set forth plans for future leadership development, and are now moving to integrate leadership training into the development of our tenure track scientists.

In training, we have implemented a strategic, competency-based program: The Academy for Career Excellence (ACE). ACE is a centralized academy built on the identification of competency requirements in all job categories. The Web-based system then provides access to both standardized and custom-designed courses that allow employees to obtain training in the required competency areas. The goal of ACE is to address administrative and scientific training needs (by occupation or by function) to ensure that the NCI has a cadre of well-trained and prepared staff **or** to retrain staff as job responsibilities change or staff are reassigned due to the changing work requirements. A critical component of ACE will be the Enterprise Technology Training Initiative. This initiative will provide scientific and administrative staff the appropriate level of training to support the best use of IT tools being provided to the desktop. Self-assessment will determine the employee's IT competency and based on the results of the self-assessment, the employee will undergo core, intermediate, and advanced level IT training.

The NCI also supports an aggressive outreach activity that includes targeted recruitment throughout the academic, scientific and business professional communities as a means of enhancing the diversity of our scientific, business and support work force. In the past year there has been outreach to approximately 50 schools and participation at over 25 career fairs, professional meetings and major community-based organization events. This intensive recruitment effort resulted in over 700 resumes from highly qualified scientists, post-docs, administrators and student interns, which are currently being circulated to NCI program areas.

4. <u>How is the agency addressing expected skill imbalances due to attrition, including retirements over the next five years?</u>

Addressing NCI's expected skill imbalances goes beyond a simple "headcount" of anticipated turnover. It requires a comprehensive analysis of NCI's scientific, business, and financial infrastructure in relation to our strategic direction, action plans, workforce analysis, competency and training assessment/alignment, succession planning, and impact of internal and external labor market factors. The NCI administrative and business management staffs are positioned as active partners in workforce and succession planning efforts and have implemented programs to assess and respond to the future-state workforce.

Our Cancer Research Training Award (CRTA) program allows the NCI flexibility to create more structured training opportunities in the many scientific disciplines. For

example, one of NCI's specialized training program provides training in the principles and methods of epidemiology, genetics, and biostatistics, and their application to etiologic research in cancer, including multi-disciplinary studies. This program is targeted to expand the pool of experienced epidemiologists, geneticists, statisticians, and others who can apply their expertise to identify the causes of cancer and the means of cancer prevention efforts. We will be expanding this program to develop informaticians, a new field seriously understaffed due to lack of professionals available and severe outside competition.

NCI is also undertaking an extramural staff training/education initiative to increase its emphasis on developing and enhancing the administrative and scientific capabilities of our extramural staff in support of our critical public health mission. Training/education programs will be developed for new and continuing staff in scientific, administrative, and support occupations and will address scientific disciplines including medicine, behavioral, epidemiology, basic, business, management, secretarial and project management. The training will address what employees need to do their jobs well which will be identified through core competencies and performance expectations, how do employees do their jobs well which will be identified through a compilation of best practices, what do employees need to enhance their jobs which will be identified through role and discipline specific enrichment and what new skill sets are needed for employees such as computer skills, statistical methods, etc.

New scientific initiatives and recruitment efforts are the outcome of strategic direction and they require aggressive national searches and/or targeted recruitments aimed at reaching the best and brightest scientific talent. Internal recruitment, scientific, and leadership resources are utilized to attract high quality, diverse talent. Additionally, NCI is working with NINDS to arrange for a competitive relationship with a family of consultants to conduct ongoing searches for scarce skills and to attract highly effective individuals for competitive positions. Consultants will also be used to provide a great deal of modern market intelligence that will be utilized to assess skill gaps against labor market conditions. Staffing expected gaps in the area of biology for lower and mid-level skills is accomplished through the use of a highly effective open continuous recruitment method that focuses on continuously attracting highly effective biologists against approximately 40 subspecialties of biology. A Medical Officer open continuous recruitment method is also being established to address expected gaps in Medical Officer requirements. Where realignments have resulted in skill shortages, the internal workforce is provided training that is aimed at filling the skills gap. Additionally, NCI aggressively continues to recruit and train students to develop skills in cancer research and provide opportunities for the best and brightest to work at the NCI in the future.

5. <u>What challenges impede the agency's ability to recruit and retain a high-quality, diverse work force?</u>

Our challenges are working within the constraints of existing appointment mechanisms that may not be as flexible or responsive and offer comparable recruitment approaches and compensation and benefits that mirror the private sector. In addition there are

government wide challenges associated with moving private sector talent into and out of the Government easily due to conflict of interest concerns and ethic issues. By it's very nature, the world of cancer research is characterized by the unknown. As we narrow our focus on discovering the causes of and cures for cancer, it is becoming increasingly more difficult to predict where tomorrow's research may lead us. As a result, we are finding it equally difficult to plan which skills will be needed in future years to match the needs of the science. As we mentioned before, we are recruiting for staff today, in specialty fields that did not even exist only a few years ago. Proteomics and molecular genetics are two such fields in addition to bioinformatics. Such uncertainties cry out for a system which can respond immediately to emerging skills needs as well as provide a level of compensation and benefits needed to attract precisely the limited talent that is available and needed to meet the evolving science demands. It's very difficult to attract and retain the best and the brightest scientific talent without a significant overhaul of our compensation system. The NCI currently uses as many as 14 different hiring and compensation mechanisms found in U. S. Code Titles 5, 38 and 42 to appoint scientific, clinical, technical and support staff, each with its own unique procedural requirements. A more flexible and efficient, single appointment mechanism could enhance our ability to hire and retain a high-quality diverse work force, and reduce the current time and resources expended today. Lengthy approval process and legislative caps on pay severely inhibit NCI's ability to recruit individuals with special expertise to perform mission-critical functions.

6. Where has the agency successfully delegated authority or restructured to reduce the number of layers that a programmatic action passes through before it reaches an authoritative decision point, e.g., procuring new computers, allocating operating budgets, completely satisfying a customer's complaint, processing a benefits claim, and clearing controlled correspondence?

In the past four years NCI has delegated over 50 administrative authorities to the lowest practical levels without compromising necessary oversight. A combination of initiatives including centralization, delegation, decentralization and contracting out initiatives have been implemented to assure efficiency where appropriate, economy where feasible and customer service across all areas.

A combination of centralization and delegation resulted in major delayering and more streamlined decision making. Due to delegation of authority and restructuring the follow delayering has occurred:

personnel actions - from 8 to 3 review layers,
travel actions - from 4 to review 2 levels,
procurement actions - from 8 to review 3 levels.
cash awards - from 6 to 2 levels

The following are specific examples:

NCI consolidated the cross-cutting "core" information systems and support services from 7 divisions/centers and 8 offices into an Institute-wide Information Technology function. Consequently, 48 Information Technology networks were combined into one single and centralized unit. This resulted in a savings of 6 million dollars annually while at the same time increased access to 100% of the Institute, increased technology sophistication for all, and increased core services availability (eg. The internet) for all users. This consolidation also brought a higher level of service support to all NCI staff. Additionally, the overall user base has gone from 1900 staff in 1997 to 5300 individuals in 2001, while annual help/support desk expenses per user have gone down from $1,475 to $962.

The purchase of a commercial classification system known as COHO and implementation of automated procedures to facilitate and enhance decision making at lower levels not only for classification efforts, but also staffing, performance management, human resource development, and employee relations produced higher levels of productivity and significantly improved service delivery at lower authoritative decision points. The result was a streamlined process that expedited placement actions with substantial savings by reducing classification time from days to hours. For example, implementation of the commercial classification process resulted in a savings, after acquisition expenses, of over $300,000 for FY2000. Further, the process and delayering reengineering analysis provided the basis for the conduct of an Institute-wide pay study so that additional delayering can be accomplished for more complex decision making on compensation and appointment cases.

The NCI lead a project to develop a desk-top procurement system to simpliy electronic ordering and maximize the use of credit card. This was done using a Cooperative Research and Development Agreement, that required the private sector to develop the system, at their expense, using our expertise. The end result is a state-of-the art e-commerce ordering system that in essence contracted out a good portion of the procurement process, as little expense to the government. It has resulted in a delayered approach to ordering (0 layers for orders under 2,500 if you are an authorized credit card holder) and a reduction in the number of purchasing agents and reviewing officials required.

Where can the agency improve its processes to reduce the number of layers that a programmatic action passes through before it reaches an authoritative decision point?

Two examples are as follows:

NCI can reduce the number of layers that compensation actions pass through if validated competitive market based criteria and more absolute internal guidelines were in place. It is expected that a current NCI study will be accomplished by the end of June and produce a new process that will reduce the number of layers that a compensation

action passes through before it reaches an authoritative decision point while providing adequate scrutiny in the approval process.

NCI is currently centralizing the replacement and purchases of computer equipment in the Office of Management to have a systematic approach to managing the resources, controls and decision points in the process.

7. What barriers (statutory, administrative, physical, or cultural) has the agency identified to achieving workforce restructuring?

Improved return on capital and greater efficiencies could be realized if modern statutory and/or administrative guidelines were available in the following areas: use of Title 42 for all NIH positions would create significant savings and improved human resources service delivery; ability to extend the probationary period for a variety of circumstances would provide greater flexibility in managing performance and improving return on capital; provide some key benefits for appointments of less than or equal to twelve months to make the government more competitive with the private sector; establish alternatives to ACWA examination; allow use of buyouts to address skills overages that would result in more efficient realignments and greater levels of productivity to accomplish critical mission related work; more streamlined and automated performance management tools; and establish modern government-wide benchmarks/measurements for cross-cutting administrative work

The ability to physically co-locate all NCI functions into one geographic location would provide an opportunity for possible restructuring of functions such as core scientific support service, facilities and infrastructure support, administrative service support, etc.

Attachments:

Attachment I – Workforce skills
Chart – NCI Staffing Plan

Attachment 1

National Cancer Institute Workforce Planning

Response to the question: What skills are currently vital for the accomplishment of the NCI's goals and objectives?

The following table provides a representative sample of the extensive human resource requirements NCI must meet to continue to keep pace with the scientific and technological opportunities at our doorstep. In general, we need people who can:

- Understand and coordinate collaborative, multidisciplinary activities.
- Facilitate the multitude of quality control and analysis issues associated with large-scale interdisciplinary studies.
- Effectively use the broad range of technologies now possible for accelerating cancer research.

To accomplish our goals for:	We need more people with expertise and experience in:	To support (specific initiatives/programs):
Research on cancer and G*enetic and Environmental* interactions	▪ Multidisciplinary research focused on the pediatric genetic disorders that predispose to bone marrow failure, acute leukemia and solid tumors	*New Clinical Genetics Branch* within the Division of Cancer Epidemiology and Genetics Human Genetics Program
	▪ New initiative to improve methodology for measuring dietary intake by quantifying and adjusting for dietary measurement error in using food frequency questionnaires	*Expansion of the Nutritional Epidemiology Branch* within the Division of Cancer Epidemiology and Genetics Human Genetics Program
Development of *Cancer Imaging* technology	▪ Discovery and development of molecularly targeted imaging probes	*Development of Clinical Imaging Drugs and Enhancers* program (Biomedical Imaging Program, Division of Cancer Treatment and Diagnosis)

To accomplish our goals for:	We need more people with expertise and experience in:	To support (specific initiatives/programs):
Research for *Defining the Signatures of Cancer Cells*	▪ Biomarker development and validation, proteomics, and bioinformatics to guide the efforts of a large interdisciplinary researcher network to develop sensitive and specific tests for the earlier detection of cancer. The network involves 18 Biomarkers Developmental Laboratories eight Clinical and Epidemiological Centers, two Biomarkers Validation Laboratories, one Data Management and Coordinating Center, and one interagency agreement.	*Early Detection Research Network* (Division of Cancer Prevention)
	▪ Coordination, administration, and customer access management for the beamline for X-ray crystallographic analysis of cancer molecules to provide the scientific community with the most powerful and advanced technology and expedite the development of targeted therapeutics	*Construction and management of bending magnet and insertion device dual beamline* research resource (Division of Cancer Biology)
	▪ Development of clinical cancer diagnostic tests	*Program for the Assessment of Clinical Cancer Tests* (Cancer Diagnosis Program, Division of Cancer Treatment and Diagnosis)
Research in *Cancer Biology* that supports most other NCI priorities	▪ Managing the interface between cancer biology and information technology and its application to mouse model development and use. This effort supports the building of an infrastructure to provide critical resources, databases, and information to the cancer research community that would not otherwise be available, avoid redundancy, and expedite research efforts in cancer biology.	*Mouse Models of Human Cancers Consortium* (Division of Cancer Biology)

To accomplish our goals for:	We need more people with expertise and experience in:	To support (specific initiatives/programs):
Research and development on *Molecular Targets of Prevention and Treatment*	▪ Interdisciplinary approaches to molecularly targeted drug discovery and development	*Numerous initiatives related to target drug discovery and development* (Developmental Therapeutics Program, Division of Cancer Treatment and Diagnosis)
Research on *Tobacco and Tobacco-Related Cancers*	▪ Leadership and support for research-based smoking cessation clinic: Highly trained clinician/researcher, a clinical psychologist, and a nurse practitioner to provide leadership on the development and implementation of behavioral treatments, the training of staff, and management of grant portfolio and Transdisciplinary Tobacco Use Research Centers, and dissemination of information	*New Tobacco Cessation Clinic* (Division of Cancer Control and Population Sciences)
Clinical trials	▪ Medical oncology, clinical trial design and analysis and monitoring for the oversight of a major NCI program that links community-based physicians with cooperative groups and cancer centers(as research bases for participation in NCI-approved clinical trials	*Community Clinical Oncology Program* (Division of Cancer Prevention)
	▪ Provide oversight, monitoring and analysis for a large-scale randomized clinical trial that will compare the lung cancer detection rates of single view X-ray and spiral computed tomography (CT) screening in smokers or former smokers.	*Lung Screening Study* (Division of Cancer Prevention)
	▪ Pre-clinical chemoprevention studies, clinical trial design, informatics and biometry to lead two work groups formed to address pre-clinical and clinical research issues such as long-term toxicity issues, mechanism of action and clinical trial design	*Estrogen Receptor - Negative Breast Cancer Study Project* (Division of Cancer Prevention)

To accomplish our goals for:	We need more people with expertise and experience in:	To support (specific initiatives/programs):
Research and interventions to support *reducing cancer-related health disparities*	▪ Coordinating and supporting the interface between social and biomedical scientists to implement a new initiative for addressing cancer-related health disparities with a lead scientist, a statistician to conduct rapid turnaround statistical analyses about cancer trends and the cancer burden, and a senior informatics specialist	*Centers for Population Studies in Cancer* (Division of Cancer Control and Population Sciences)
Supporting researchers with need resources and support in *Informatics and Information Flow*	▪ Bioinformatics to support major NCI initiatives: - Implementation of and programming for large-scale relational databases - World Wide Web technology for setting up servers, developing tools for internet technology, and using Web software - Efficiency in scientific programming using modern software engineering tools to extract and process genetic data from large collections of public databases - High-powered systems design analysis and implementation	*NCI's Center for Bioinformatics* (Division of Cancer Epidemiology and Genetics)

NCI Hiring Plans for FYs 2002/2003

	FY 2002	FY 2003	Total
INTRAMURAL			
Senior Investigators [1]	0	16	16
Investigators [1]	12	12	24
Other MD/PhDs, in FTE positions	100	36	136
Other MD/PhDs in non-FTE positions (IRTA, VF)	200	200	400
Other lab/clinical staff => GS-13	25	29	54
Other lab/clinical staff =< GS-12	76	52	128
Admin/support staff => GS-13	27	20	47
Admin/support staff =< GS-12	35	18	53
Infrastructure support => GS-13	0	0	0
Infrastructure support =< GS-12 [2]	0	0	0
Summer and other temps not listed above (include summer IRTAs)	275	275	550
TOTAL INTRAMURAL	750	658	1408
EXTRAMURAL			
HSAs/SRAs and other senior level science administrators => GS-13	0	41	41
Other science administration positions =< GS-12	42	35	77
Grants Management and R&D Contract Staff => GS-13 [3]	26	23	49
Grants Management and R&D Contract Staff =< GS-12 [3]	21	22	43
Administrative and support staff => GS-13	26	22	48
Administrative and support staff =< GS-12	71	17	88
Infrastructure support => GS-13	0	0	0
Infrastructure support =< GS-12 [2]	0	0	0
Summer and other temps not listed above	25	25	50
TOTAL EXTRAMURAL	211	185	396
IC TOTAL	961	843	1804

[1] Using OIR professional designations

[2] Include all wage grade positions related to infrastructure in this group

[3] Includes 1101, 1102, 301 and 303 series where individual is engaged in these activities on a full-time basis.